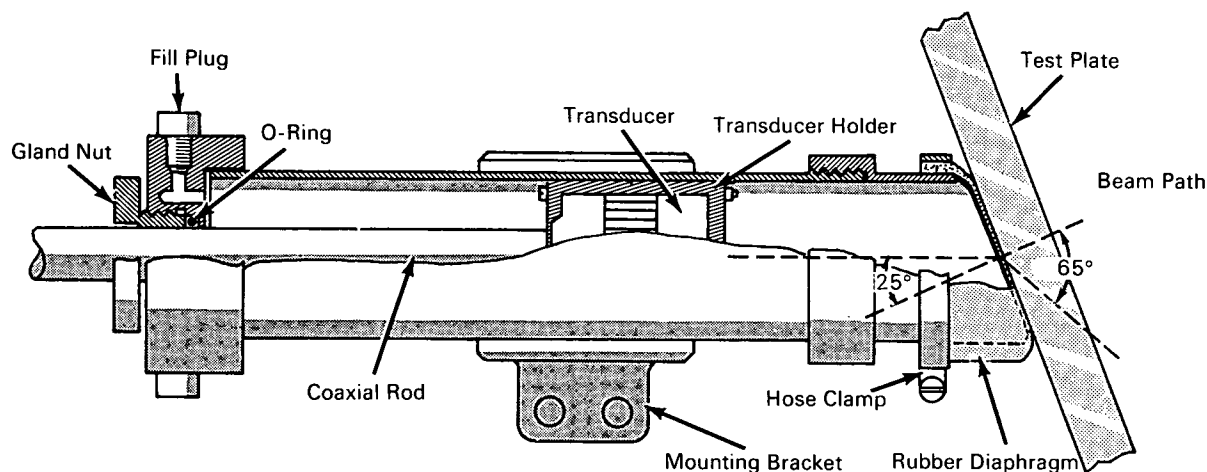


NASA TECH BRIEF



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Ultrasonic Water Column Probe Speeds Up Testing of Welds



The problem:

To devise a method, incorporating ultrasonic methods, to speed up the testing of welds. In testing the Saturn IC tank welds, a manual testing operator could test about 12 feet an hour, or take about 12 hours to test 1 of the circumferential welds. The size of the Saturn IC tanks precluded the use of any of the immersion testing methods. The commercially available wheel ultrasonic probe was not satisfactory because it could not be used at the desired test beam angles.

The solution:

An ultrasonic device consisting of a coaxial rod and transducer enclosed in a cylindrical probe which is filled with de-ionized or distilled water. A rubber diaphragm is molded to produce the desired test beam angle.

How it's done:

The water column probe contains the water and a beam transducer that can be focused to a desired point in the material by moving the transducer to various levels. A transducer holder acts as a spacer and maintains the position of the transducer after setting; filler caps maintain the water level. The rubber diaphragm is the contact surface of the probe, and retains the water in the column. The thin membrane on the face of the diaphragm is flexible enough to allow full contact with slightly rough or curved surfaces, and can be moved close to a high weld bead.

Notes:

1. The water column probe is not as thorough for testing welds as the manual techniques. The advantage is in making a quick scan of the weld. Until greater confidence is gained based on production experience, the manual test should be used as a backup check on indications and to provide more depth and defect type information.

(continued overleaf)

2. Inquiries concerning this invention should be directed to:

Technology Utilization Officer
Headquarters
National Aeronautics and Space
Administration
Washington, D.C. 20546
Reference: B66-10577

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: J. M. Hoop and J. A. McDonald
of the General Electric Co.
under contract to
NASA Headquarters
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